R&D Scoping and Framing Workshop
R&D Roadmap: Managing Western Water as Climate Changes
February 20 and 21, 2008

General Consolidated Summary
Responsibilities, Challenges, and Needs
Perspectives of Reclamation Water Operations Managers

Note: The information presented herein is intended solely to facilitate a working level dialogue between the federal scientific community, and Reclamation water and environmental resource managers, on climate change research needs in support of Western water management. As such, "*this information has not been formally disseminated by the Bureau of Reclamation and should not be construed to represent any agency determination or policy*".[1]

Water Operations Management Responsibilities

Project Operations

- Schedule and execute all facility operations to store, release, and divert water for all project purposes, including hydropower generation and water deliveries for irrigation, municipal supplies, environmental purposes, recreation, and (with USACE) flood control.
  - Within constraints of state water laws and compacts, international treaties, etc
- Plan annual operations based upon forecasts of supply and demand and the competing priorities for water use.

Project Planning (including for changes in existing Operations)

- Plan new water projects, long-term operations, or changes in operations of existing projects. Forecast basin inflows, water demands, water storage, releases and deliveries, power generation, reservoir levels, downstream effects, groundwater effects, environmental, economic, social, and recreation consequences.
- Carry out these studies in compliance with the National Environmental Policy Act, the Endangered Species Act, and numerous other Federal and State regulations requiring use of best available information.

Dam Safety

- Regularly assess and mitigate, using a risk-based approach, potential hazards to the integrity of all Reclamation structures whose failure could cause loss of life and economic damages. Potential hazards include extreme hydrologic events.

Research and Development Needs

Future Climate Scenarios

- Probabilities of emission paths?
- Which climate models should be used?

Demand Forecasting

- Improved short-term forecasts (e.g., 3-month) of water demand
- Long-range forecasts of changes in water use and demand

Water Supply/Runoff Forecasting

- Intra-Annual
  - Volume Forecasting reflective of changing climate
  - Timing Forecasting reflective of changing climate

1/ Stated in accordance with Information Quality Act (Public Law 106-554), Final Information Quality Bulletin for Peer Review (Office of Management and Budget, December 16, 2004).

- 2-5 year outlooks in volumes and timing relevant to climate state

- Longer than 5 Year Projections
  - Method for adjusting historic flows to reflect past or projected climate change
  - "Basin-scale" or "project-relevant" climate change information
  - Forecasts of climate change impacts on groundwater supplies
- Improved estimates of probability associated with all water supply forecasts

Dam Safety/Flood Operations

Knowing the effect of climate change on dam safety risk, as climate change could affect possible extreme hydrologic events and flood frequencies.

Knowing the effects of moving climate on flood control rule curves (~30-year moving antecedent period)

All Tools and Capability Developed Should Demonstrate Following Characteristics

- Understandable, explainable to managers, solicitors, public, water users
- Widely accepted (have scientific credibility, can't be a hotly debated method, approach)
- Relatively affordable
- Incorporated using "in-house" expertise
- Adaptable to changing planning objectives and constraints
- Adding value, not just more complexity and uncertainty, to the decision

1/ Stated in accordance with Information Quality Act (Public Law 106-554), Final Information Quality Bulletin for Peer Review (Office of Management and Budget, December 16, 2004).